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**Ohio Mining Journal**

**Title:** Coal and Coke: Some Account of the Mining Regions of Western Pennsylvania

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**Issue Date:** 1892

**Citation:** Ohio Mining Journal, no. 21 (1892), 137-155.

**URI:** <http://hdl.handle.net/1811/32640>

**Appears in Collections:** [Ohio Mining Journal: Whole no. 21 \(1892\)](#)

## COAL AND COKE.

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### SOME ACCOUNT OF THE MINING REGIONS OF WEST- ERN PENNSYLVANIA.

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BEING PRINCIPALLY THE EXPERIENCE OF A TENDERFOOT,

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ALONG WITH A COMPANY OF MINING ENGINEERS AND EXPERTS FROM  
OHIO.

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W. B. HEARN, PROPRIETOR.

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#### *The Cadiz Republican:*

The Ohio Institute of Mining Engineers usually holds two meetings a year, one in winter time, when papers are read and scientific questions discussed, and one in summer, which usually takes the form of an excursion to some interesting part of the country, where the direct work of obtaining information may be modified by the pleasure of an outing.

The excursion this summer, from August 2d to the 6th inclusive, was to the famous coal and coke regions of south-western Pennsylvania, which in some respects are the most noted coal fields in the world. Having received an invitation to accompany the Institute on this excursion, I gladly accepted it, partly in view of getting away from office work for a few days, but mainly for the attraction offered of exploring a region entirely new to me, but one of which I had read and heard much.

The excursion left Columbus on Tuesday morning, the 2d, and was joined by members of the Institute at numerous stations all the way across the State to Bellaire. I joined the party at Zanesville. The route was over the Baltimore & Ohio Road,—fare for the round trip \$5.25. There were no dead-heads. The Railroad Company treated us royally, giving us a special car clear through, and in the mining regions furnishing us with a special locomotive and engineer to take us wherever we wanted to go, on our own time, an officer of the Road being detailed to accompany us wherever we went.

The entire party, excepting myself, was made up of mining engineers, or mining experts, men who had large experience in

the mining business, and whose objects in visiting the Pennsylvania mines was to familiarize themselves with the methods and machinery of that region, and if possible to learn something new in the profession to which they had devoted their lives.

Our party was composed of the following named people:

Hon. R. M. Haseltine, of Columbus, Chief Mine Inspector of Ohio, who is the Secretary and Treasurer of the Institute, and was the leader and manager of the Excursion.

F. W. Sperr, of Columbus, Professor of the Mining Department of the Ohio State University.

John Kane, of Columbus, editor of the *United Mine Workers Journal*, a labor union paper, devoted mainly to the interests of coal miners. By the way, Mr. Kane was the only newspaper man in the party, excepting myself. Born in the mining regions of England, he has handled the pick many a day in both England and America, and although still a comparatively young man has served as President of the State Executive Board of the Miners' Union of Indiana, and filled many other important positions. He has been the editor of the *United Mine Workers Journal* at Columbus for nearly a year past.

Alexander Beattie, of Nelsonville, Mine Inspector of the Second Ohio District.

Thomas H. Love, of Leesville, Mine Inspector of the Fifth Ohio District, which, by the way, includes the counties of Harrison, Carroll, Jefferson, and half of Columbiana,—the home District of most of the readers of this paper.

J. E. Short, of Columbus, Mine Inspector of the First Ohio District.

W. H. Davis, of Byesville, Manager of the Empire mine.

Cyrus Evans, of Wadsworth, Mine Boss.

George Harrison, of Byesville, ex-Superintendent of the Trail Run mine.

Ebenezer Lewis, of Krumroy, Mine Inspector of the Seventh Ohio District.

W. H. Turner, of Cambridge, Mine Inspector of the Fourth Ohio District.

R. H. Miller, of Shawnee, Mine Inspector of the Third Ohio District.

H. V. Karl, of Henking, mine operator in southern Ohio.

F. N. Barnes, of Coshocton, Manager of the Columbus Coal Company.

W. G. Hay, of Coshocton, coal operator.

J. L. Morris, of Canal Dover, ex-Mine Inspector, and at present General Manager of the Post Boy Coal and Iron Company.

J. W. Bryant, a manager of coal and iron works in Tennessee.

Lucien S. Johnson, of Myrtle, Kentucky, Superintendent of the mines of the White House Cannel Coal Company.

James A. Anderson, of Cleveland, coal operator.

Chalkley Dawson, of Bellaire, Superintendent of the Mill mine of the Bellaire Steel Works and Nail Mill.

John F. Kellar, of Massilon, one of the proprietors of the Drake Coal Company mines.

J. C. Mellinger, of Nelsonville, Superintendent of the C. L. Posten & Co. mines.

J. G. Chamberlain, of Goshen, Va., largely interested in Railroads and coal mines, formerly of Columbiana County, Ohio.

C. A. Dean, of Redfield, Superintendent of mines of the Columbus and Eastern Coal Company.

W. A. Werner, James McKinney, and E. C. Downerd, of Zanesville, mine owners and operators.

John Roberts, of New Straitsville, Mine Superintendent.

C. C. Sharp, of Buchtel, Chief Engineer of the Columbus & Hocking Coal and Iron Company. By the way, Mr. Sharp is a relative of Dr. W. T. Sharp, of Cadiz. He is a comparatively young man, being a graduate of the Ohio State University, of the class of '88, and holds his present responsible position through rapid, though well-earned promotions.

Besides the above there were in the party Mrs. Haseltine, Mrs. Kane, and Mrs. Beatty and her two daughters, the object of the ladies, however, being to visit friends in Pennsylvania, rather than see the mines, though they bravely went down one or two of them.

We crossed the Ohio River at Bellaire, stopped a short time in Wheeling, proceeded on through the oil regions and forests of derricks of Washington County, Pa., crossed the Monongahela river a short distance above Pittsburg, saw the famous town of Homestead from across the river, noted where the Pinkerton barges had landed and the terrible fight had occurred. It was after dark when we were in this region and we could see as we passed that hundreds of men were at work in the steel mills. We reached Connellsville at eleven o'clock, where we soon found hotels, and turned in for the night.

On Wednesday morning after a sound sleep and good breakfast, we were in our special car at the station at half past seven o'clock, and after a run of about ten miles to and through the town of Mt. Pleasant, we arrived at the Standard Mine of the Frick Coke Company. This is regarded as one of the finest plants in the coke regions. The mine supplies 907 ovens with

coal, the daily output of coal being 2,500 tons, employing about 500 men.

Here we met Mr. Robert Ramsey, the Superintendent, who showed us through the works and answered all questions in regard to the hoisting machinery and the immense engines of six hundred horse power. Among other features of the works is an electric light plant, which supplies light for part of the mine, but not all, for reasons which we shall explain further on.

Mr. Ramsey showed us into a building where a set of expert workmen were engaged in making a complete miniature model of this entire works, including the buildings, engines, hoisting towers, and everything pertaining to the works, for exhibition at the World's Fair. Even this model, when completed, will cost the Company five thousand dollars. It will be a perfect miniature Pennsylvania Coal Works. The cost of a coal plant like this runs well up toward a million dollars.

After examining the machinery, and the manner of hoisting and delivering coal, our party prepared to descend into the mine. We all put on suits of blue and checked overalls and blouses, and looked a good deal like a set of regular miners. I had never been down a mine before, and looked with suspicion on that open platform which carried the coal cars up and down, without any guard-rail or other protection to keep one from falling off. But I had made up my mind to go where the rest went, and boldly stepped on the platform, only ten of us being allowed to go down at one time. The mine was three hundred feet deep, and when we commenced to descend I held firmly to the two fellows on either side of me, and wondered whether there would be any accident. I wondered whether it would be possible for that platform to go down so fast as to leave us in mid air, and what might happen in that event.

But before I had time to arrive at any conclusion we were at the bottom of the shaft, and our guide called to us to "come off at this side." We obeyed instructions, and on looking around I found that we were in a place resembling a large double-track railroad tunnel, solidly arched with brick, made white and clean with whitewash, and beautifully illuminated with incandescent electric light. I have been in some of our own Harrison County coal banks, but this was quite a different looking place, and I began to have an improved opinion of Pennsylvania mines.

Following our leaders along the tunnel some three or four hundred feet we were taken to the engine room, where an immense steam engine was at work pumping the water out of the mine. The mine is so drained that the water is all brought to

one point from which it is pumped out through a large pipe which discharges the water at the top of the shaft. The steam to run this engine is conducted from the boilers in the works away up there on the surface of the earth. This engine runs day and night, and pumps out three thousand tons of water every twenty-four hours,—considerable more in weight than the coal which is taken out in the same time.

Now we go off through a tunnel in another direction to see the stables. Here we come to a place which looks, and smells too, very much like any other stable. Here is the wooden stall, the trough, the hay rack, everything complete, some of the stalls empty and others filled with horses and mules feeding.

In this mine the cars loaded with coal are hauled in from where they are filled in the different parts of the mine to the base of the shaft, by mules and horses. Some other mines have rope haulage, as I shall explain further on. Unlike the miners, the mules and horses remain down here day and night, and are never taken out until they become unfit for service.

It happened that the miners were not at work to-day, and it was therefore decided that we would not go far into the mine. So after spending half an hour in these well-lighted tunnels, we all came back to the mouth of the shaft, and prepared to ascend again to the outside world. A signal was given to the man at the engine away up there in the outside works, and in a moment the hoisting apparatus came down. I stepped on the platform with the first ten, held fast to the fellows on both sides of me and leaned against the one in front, and in a moment we were at the top. I stepped off quickly, glad to be on the earth again, and realized as never before the vast extent of the sky, and the immense and inexpressible beauty of the sunshine.

We boarded our car and returned to Connellsville for dinner. After dinner we took our car again and ran out two miles to Wheeler to visit the Morrell Mine, under the management of Mr. Isaac Taylor. The mine which we had visited in the forenoon was a model of perfection, in machinery, outfit, and management. The Morrell mine is quite a contrast to it in many respects. It is an old mine, having been operated for twelve years, and is run on old time principles. A mining friend had remarked to me that I had not seen anything of the practical workings of a mine in our forenoon's trip, and that I would not until I got to where the coal diggers were at work.

Arriving at the Morrell mine we again put on our mining clothes, and prepared to go in. This is what is called a "Slope" mine. There is no shaft to descend. The mine opens at the top of the hill and descends at an angle of perhaps ten degrees until

the coal vein reaches a level. There is a double railway track at the main entrance on which one line of loaded coal cars are coming out while another line of empty cars are descending into the mine, drawn by steel cables and operated by powerful steam engines. No one is allowed to go in there, however, as it would be dangerous folly to get in the way of a train of such cars.

No,—our guide informs us, we will go down the “man-way.” I could not just tell why that word “man-way,” had an ugly sound to me. Possibly it was because I had been contemplating the danger of trying to go down the slope on the car tracks. I didn’t see any other opening into the hill, but trudged along with the rest of the party, wondering where the “man-way” was, and what it looked like. Soon we came to a small sized frame building, and on entering I saw that a stairway extended from its floor down into the earth, and the fact dawned on me that this little building was the entrance to the “man-way.”

Before we started down, however, our party was supplied with lamps,—*safety* lamps. Then there are no electric lights in this mine? I inquired. O, no; was the brief answer. The preparation of the safety lamps called up recollections of explosions and all dreary mine disasters, but I swallowed whatever was in my throat, and prepared to go down the “man-way” with the rest of the party. Down we trudged ten steps, then turned at right angles and down ten more, then turn again and down, and so on down, down, down, all sunlight gone, nothing to illuminate the dreary darkness but the faint light of the lamps. At last we reached the bottom. Some one said that the descent was two hundred feet. I have no certain knowledge as to whether the statement was correct or not. But I know that it was the deepest, darkest, gloomiest place I had ever been in.

Our guide struck a match and lighted a coal oil torch. Several of our party expressed surprise, and inquired whether there was not great danger in striking a match or carrying an open light? In reply the guide said that there was no danger for the first quarter of a mile, until we should come to the shut-off, or cross-current, or something else which I couldn’t understand. So we took up our line of march, single file, following the guide.

The tunnel, I observed, was about ten or twelve feet wide, and eight or nine in height, frequently coming down to six, and even five feet, requiring us to stoop in places, though usually with plenty of room to walk erect. There were no brick arches; nothing but walls of coal and roof of slate.

On we trudge, down quite a steep grade, the ground being soft and muddy in places, a small stream of water running along close to either wall. Now there is a halt, as some sort of obstruc-

tion is reached. The guide extinguishes his coal oil torch, and we are left with only the dim light of the safety lamps. We have come to a wooden partition right across the mine tunnel. A door is opened and we all pass in. Another partition, two or three rods in front, shuts us all in, and our guide waits until the last man gets within the first partition, when the door in front of us is opened, and we all pass on, the door being carefully shut again behind us.

We have now passed into the part of the mine where gas may be generated, and where no light except a safety lamp may be admitted. As we march on, single file and in comparative silence, some one asks the guide how far it is down to the level, and the reply comes that it is five thousand feet from the entrance. Then I began to comprehend that our first stopping place was to be nearly a mile from where we entered the mine. I wondered whether I would ever get out of there again. I knew that the sun must be shining, but that we were hundreds of feet below where the light could reach us, and that we were posting on every moment deeper and farther away from it.

In fancy I thought that possibly we might be on our way to the bottomless pit, and that these beings with me might possibly be a set of fiends leading me on to my fate. Our light was not sufficient to clearly show the countenance of any man, and in the queer costumes and weird light it was easy for the fancy to paint a set of veritable Satans. I reflected that I had never known one of these men until yesterday, the only one of the party whom I had ever previously met, having gone back with several others, immediately after we started to enter this mine, and was now basking in the sunshine on the outside.

I could not think of turning back now, alone in the darkness, and would not have been permitted to do so had I attempted it, for it was one of the rules that we must keep together. While indulging this flight of fancy we come now to a new sort of obstruction. We ascend a pair of wooden steps and passing on a few feet descend another pair to our former level. This is an "over cast," some one explains to me. It provides for the passage of an air current at right angles to the passage way along which we are traveling. A gentleman near me, who was a native of Wales, added, that it is called a "wind-bridge" in the old country. I find that the voices of these men are the same that they had been all along, and am reassured. They cannot be fiends after all. I will confide in them again, and go along with them trustingly. For this afternoon's, or night's adventure, at least, they are the only protectors I have in the world. They are my best and only friends now.



At last, after a walk of a mile, and various experiences, we reach the "level," and here we are taken through entries at many turns and angles, and find many miners at work. On, on we go, stopping now and then at points of special interest to hear explanations from our guide, and stopping at times to speak to the miners, or to watch them at their work. Once a miner proffered me his pick, which I took, and enjoyed the pleasure of digging at least one bushel of coal. Others of our party exhibited their mining skill in the same line.

While thus far in the mine, probably a mile and a half from the entrance, a little incident happened which impressed me considerably, though probably unnoticed by others. While passing along by some miners at work a friend at my side suddenly recognized two of the workmen as his intimate personal friends. He had not seen them for several years. He knew that they were in this mining region, but had no expectation of meeting them until he came thus suddenly upon them at their work thus far under the ground. Their greetings were warm and sincere on both sides, but necessarily brief, for we had soon to pass on. I wished that we could take the two with us, for there was something in the tone of their voices and in their manners which indicated refinement and tenderness, and it seemed so lonely to pass on and leave them there. The brief conversation to which I had listened gave me a new impression of the life of the miner.

After remaining in the Morrell mine for about two hours our party prepared to retrace their steps, and a walk of a mile and a half brought us again to the bottom of the "man-way," which we soon ascended, and came out again to see the light of day. It was a bright August afternoon, with bright sunshine, fleecy clouds, blue sky, and green trees and fields, and after being under ground for two hours the world never seemed so beautiful before.

It was now half-past three o'clock, and we were to visit another mine this afternoon, each day's work having been carefully mapped out and provided for in advance by our excellent leader and manager, Mr. Haseltine. We boarded our car and ran out to the town of Dunbar, and proceeded from the station on foot, nearly a mile to the far-famed Hill Farm Mine, superintended by Mr. Frank A. Hill.

This is the mine which had the terrible calamity two years ago, and as one object of our visit was to see the different phases of the mining region, this particular mine was included in the list. I noticed that all the members of our party were thoroughly familiar with all the details of the accident at this mine, and in talking it over it was generally agreed that things had been badly

managed, and that much of the loss to the mining company might have been averted had better methods been adopted following the accident.

The principal facts in regard to the accident were in brief as follows: A boy whose duties called him to work at and near the mouth of the mine imagined that he saw danger to those inside on account of some sudden flow of water. Becoming panic stricken he picked up an open lamp and rushed down the slope of the mine to give warning to the miners within. The lamp came in contact with a flow of gas, and within an instant there was an explosion which extended far under the hill and to every part of the mine. The timbers near the mouth of the mine were set on fire, and later this communicated with the coal along the passage way, and shut off all access to all workmen within the mine.

It was supposed that the men were all killed by the explosion, but as there was hope that some of them, in some distant part of the mine might have escaped sudden death, it was very greatly desired that they might be reached. There were the heart-breaking scenes at the mouth of the mine, which always occur on such occasions, where weeping friends hoped against hope that they might be permitted to look upon their loved ones in life again, but the mouth of the mine was a furnace, and there seemed no way to reach any one within.

Days passed, and weeks, and months in vain efforts to extinguish the fires, and as a last effort it was decided to seal up the mine, air-tight, so that the fire might be extinguished by lack of oxygen to feed the flames. This was done, and in order to reach the men in the mine, it was decided to dig a new opening to them from the opposite side of the hill.

This was slow, tedious, and almost hopeless task. The mine was hermetically sealed, the work of opening a new entrance begun, and after nearly two years, the bodies of every one of the 31 dead miners were found, just where they had been working, none of them mutilated, most of them well preserved and natural in appearance, and every one recognized by their friends. An intelligent miner in Dunbar, with whom we talked, told us that he knew every one of the men personally, saw them all brought out, and recognized every one.

The disaster had made a deep impression on all the people of this region, and everybody was ready to talk about it. There were many sad stories told, but as usual, there were some silver linings to the dark clouds. One fact was that between the damage claims paid by the mine owners, and the public contributions which were poured in, the families of the missing men were all

provided for, and some of them placed in more comfortable circumstances than they had ever known before. Some of the widows had remarried and were happy again, and there was at least one well attested instance where the new husband went with his wife to the funeral of her former husband, whose body was not recovered, it must be remembered, until nearly two years after his death. One widow told the ladies of our party that she was to be married soon, but that though engaged for some time past, she had steadfastly refused to be married again until the body of her former husband had been recovered and buried.

This mine, after being closed nearly two years, was again opened, some three or four months since, and was now being worked again. It is a "Slope" mine, and as the hands were not at work on the day of our visit, Mr. Hill tendered our party the privilege of going into the mines on the coal cars. I noticed that the idea of going into this mine did not strike most of our party favorably. In company with others I walked down the slope some little distance into the mine, and discovered on entering that the air was oppressively warm. On inquiring the cause of this the best informed men of our party expressed the opinion that the coal in the mine was still on fire, in places. If this was not actually the fact, the charred and coked walls of the mine at least retained a high degree of heat. The thermometer at the mouth of the mine registered 120 degrees. The miners could only work by getting far in beyond where the fire had been, and by having of course, a supply of fresh, cool air, constantly supplied from the outside.

The coal cars are now ready and our party is invited to get aboard and go down into the mine. About a dozen men accept the invitation, but as I have already ventured a good deal more than usual for one day, and came out safe thus far, I decided that I will remain on the outside this time. The men remained in the mine only a short time, and on coming out were drenched with perspiration, and all expressed the hope that they might never be condemned to a hotter climate than the one which they had just experienced.

After examining the machinery of the Hill Farm Mine our party again boarded the car and we all returned to Connellsville for supper, and to remain over night.

But now that the first day's explorations in the coal regions are at a close, perhaps a little information concerning this famous region may be profitable to the reader. The great coal and coke region of western Pennsylvania is a comparatively small extent of territory,—that is, small in comparison to the whole State.

It comprises a strip of land about 55 miles in length, the richest and most valuable part being not greater than 40 miles in length, and in width from three to five miles, lying parallel to and a few miles west of the western range of the Allegheny mountains.

If surprise be expressed at the narrowness of this belt let it be explained that the general coal field of western Pennsylvania is very much wider, continuing west to and through Pittsburg and to and into Ohio, and far south into West Virginia. But the coal in this particular belt which I have described, of forty to fifty-five miles in length, and three to five miles in width, and which has become famed as the Connellsville coal and coke region, is different from any other coal in the world. It is the finest coking coal known, either in Europe or America, but is so soft as to be hardly fit for use until it is coked.

Every mine in this region has therefore connected with it a battery of coke ovens, and the coal is all dug for the express purpose of being coked, and is never hauled or shipped away except in the form of coke.

There is no care used to dig the coal in the form of lumps, for the fine coal, the slack, is just as good for coking as lumps, or even better. But if the greatest care were exercised it would not be possible to bring any large lump coal out of these mines. The coal is so soft that a man can crush a lump with but little effort in his hands. It is all brought out of the mines, therefore, looking not quite so fine as what we call slack, but very nearly so,—about three-fourths of it being slack and one-fourth small lumps.

It is pure coal, however, and one ton of it makes two-thirds of a ton of the finest and most valuable coke in the world.

The vein of coal throughout this region is from eight to nine feet in thickness,—much of it nine feet. This great thickness of the vein makes it easily mined, and of course makes every acre of it exceedingly valuable. Twenty years ago the coal privilege was bought up by speculators at ten, fifteen, or twenty dollars an acre, and where they could not buy the coal privilege at that price they bought the farms at fifty dollars an acre. Now there is not an acre in all the better portion of the region which can be purchased for less than six hundred dollars an acre.

This coal vein that I have described, averaging four miles in width, lies in the form of a canoe with a flat bottom. At each side it crops out at the top of a ridge. As you follow the vein it slopes rapidly for several hundred feet, then reaches a wide level, and at the opposite side ascends again at the side of the ridge. The slope at each side would average, perhaps a mile, leaving a

level of two miles, though this would vary, of course, with the varying width of the coal field.

If the mine is opened at either side of the coal field it is necessarily opened at the top of the ridge, and as the opening must of necessity follow the slope downward it takes the name of "Slope" mine. When the opening is made at or near the middle of the vein the coal is reached by a vertical shaft, which varies all the way from 200 to 400 feet in depth. It will readily be seen that there is no way to drain any of the mines except by pumping. On account of this fact, and on account of the depth of the vein, the work of opening a mine and providing the necessary machinery for operating it involves a large expenditure of money.

From these statements it will be seen that coal mining in this region is a very different matter from coal mining in eastern Ohio, where the mines go in at the side of the hill, and are drained with little expense by the natural slope of the coal vein.

On Thursday morning, August 4th, our party started out to visit the three mines known as the Leisenring Nos. 1, 2, and 3, situated within a few miles of Connellsville and reached by electric cars. These mines take the name of their former owner, Mr. Leisenring, but are owned now by the H. C. Frick Company, by whom they were purchased a year or two ago for three million dollars. The property includes nine thousand acres of coal land, and three splendidly equipped mines.

A ride of four miles on the electric cars and a walk of nearly a mile brought us to the No. 3 mine, which was first on our list to be visited. Here we met Mr. Austin King, the superintendent of the mine, a former Ohio man, and of course a jolly good fellow. After taking a look at the engines, the electric light plant, and the outside machinery in general, our party prepared to go down into the mine.

This is the deepest mine in the Coke regions, the shaft being 541 feet in depth. Before starting down some one laughingly suggests that perhaps we had better take checks with us. In the office of the mine is a case of brass checks, each numbered, from 1 up to several hundred, each hanging on a little hook with a corresponding number upon it. Every miner is registered and numbered, and when one starts down the mine in the morning he takes his brass check with him, and when he comes out of the mine the check is placed on the hook of its number. The absence of the check from its place shows that the man is in the mine, and in case of accident, or detention from any cause, the superintendent knows just exactly who is to be accounted for.

All ready now our party prepare to descend this mine, ten of us going down at one time. Down we go. It only takes about 40 seconds to descend 541 feet. We all keep very quiet as we go down, waiting to see just what will happen. We start from the bright sunlight of day and in a moment find ourselves in a tunnel. But this is one of the Frick mines, and everything therefore is first-class. It is not dark and dismal, as in many of the other mines, but nicely and brightly lighted by electricity. Excepting for the fact that we remember that we are over five hundred feet in the ground we might feel pretty comfortable down here.

I had imagined that electric light had solved the difficulty of the safety light question in the mines, as I supposed it could be carried by wire to every part of the mine and used safely everywhere. But I soon learned that this was not the case. The danger is that the little glass globe might get broken, and in that event the electric spark would prove exceedingly dangerous in the presence of gas. For this reason the electric lights are never used except near the base of the shaft, and in the wide tunnels near the base where there is always a very abundant supply of air; and even here their use is as yet an experiment, and looked upon with misgivings by some mining experts.

The first place to attract the attention of our party of mining engineers, in this mine, was the engine room and the pumping machinery. Next a visit was made to the stables. These were much like those in the first mine we visited and the description need not be repeated here.

Our next visit was to the Lamp room. The Lamp room we found to be a neat-looking office about sixteen feet square, with good wooden floor and nicely white-washed walls and ceiling, with desk, writing materials, &c., and brilliantly lighted with electric light. It looks exactly like any ordinary business office, after night, except that there were no windows,—not even a skylight.

The person in charge of the lamps has a responsible position. He fills them, trims them, lights them, and *locks* them, before giving them out to the miners. The locking of the lamp secures that the miner cannot open it, if he should take the notion to light a cigar, nor for any other purpose. So long as it is locked it is safe.

It is decided that we go out into this mine some distance and see some of its workings, so we each got one of the locked safety lamps, for we are now to leave the electric lights far behind. We go in groups and I am with a party of twelve. After a walk of perhaps half a mile we turn off at right angles, and then after

going some distance again turn at right angles, and again and again make changes in our direction. I make up my mind that I am going to stay right with this party of twelve, and never undertake to get out of this mine by myself. We find miners at work here and there, speak to them and pass on.

Now we hear a rumbling noise ahead of us, and it is explained that we are meeting a train of loaded coal cars drawn by mules. Our leader calls our attention to a "man-hole" near by and asks us all to follow him into it. It is an opening cut into the side of the tunnel expressly as a place of refuge in meeting coal trains. We all stand in it, and the twelve of us just fill it, standing closely together. We might have escaped the cars by crouching closely to the sides of the tunnel, but it would have been dangerous. We had the same experience several times, but always managed to get into a "man-hole."

Now we have gone about a mile and a half from the bottom of the shaft, and we come to a side entry which has two pieces of timber set cross-wise at its opening, and a large sheet of cardboard fastened up on which something is printed in four or five different languages, so that it may be read by miners of different nationalities. But every miner knows what it means without reading it at all. It means DANGER! GAS! CAUTION! It has been put there by the fire boss who has discovered an accumulation of gas in this part of the mine.

We pass on a little way and come to another entry of the same kind, and then another, and still another. "Well, our leader says, "we will go into this entry, and examine the gas. Those of you who want to make a test with your lamps have a fine opportunity here."

So the obstructions were taken down from the mouth of the entry, and we all walked in. I found courage to walk in with the rest, though I could not have been hired to go in alone for much less than the million dollars which the mine was supposed to be worth.

"Now observe the gas," our leader said, and he held his safety-lamp well up toward the roof of the mine. We all looked and there was a sudden flash in the upper part of the wire network surrounding his lamp. He moved it, here and there, still holding it high over his head, and every few seconds there would be a flash! flash! flash! Now he took his lamp to a more obscure corner, and holding it up almost the entire upper part of his lamp seemed to be filled with flame.

Two of the gentlemen near me stepped, involuntarily, around to one side of a pillar of coal. A laugh was raised on them at once, and the remark made that if an explosion should

occur it would catch them even if much farther away than that. One of them replied that he had a wife and two children at home, and he would like to have a chance to see them at least once more. I ventured the remark that if I was expected to write up and publish an account of this trip it might not be convenient for me to have the personal experience of a mine explosion, and at this remark several gentlemen who had been holding up their lamps and watching them flash, desisted, as they said they didn't want to spoil the publication of an account which they knew would be relished by a large number of readers.

Just here I may explain that the safety-lamp still in use is the same lamp practically which was invented by Sir Humphry Davy, in England, in 1815. Some improvements have been added, but the safety part is still the wire gauze screen. Gas may pass inside the screen and burn there, but the wire net work prevents the blaze from passing outside. The lamp thus becomes not only a safety lamp, but a test of the presence of gas. The only danger is where there is a sudden rush of gas, as may be occasioned by the falling slate or coal from the mine roof, or other cause. A velocity of ten feet a second carries the gas and flame right through the screen of the safety lamp, and will produce an explosion.

It will be seen, therefore, that while my mining-engineer friends were holding their lamps up, watching the flashes, or even the steady flame of gas, that there was no special danger, unless a piece of slate had suddenly fallen from the roof, or some unusual rush of gas had happened from some other cause.

We had now accomplished all the objects of our visit in this mine, and following our guide we took up our line of march for the bottom of the shaft. By and by we came out to the broader tunnel and the electric lights, and after depositing our lamps in the lamp room we stepped on the hoisting platform, the signal was given, and in a moment we were again out on the surface of the earth, under the broad sky, and with the sun to give us light.

On coming out of this mine, Mr. Ring, the Superintendent, had a pleasant surprise for us. It was a splendid lunch, which was served in one of the mine buildings. We ate it with a good relish, for it was now dinner time, and we were five miles from our hotel, and at its conclusion we had the first and only speech-making occasion of the trip. Chief Haseltine called on a number of the members of the party for remarks, and thus with the dinner and the toasts we spent a very enjoyable hour.

One of the Pittsburg papers described our party as being feasted in the mining regions wherever we came. This was a mistake. We put up at the hotels, took ordinary fare, and paid



our own bills every time. This spread by Mr. King was the only exception on the trip. We were not out for pleasure, but for information. Even the speeches at the King lunch partook of a scientific nature.

In the afternoon we visited two more mines, Leisenring No. 1, under the management of Mr. John A. Esser, and the Trotter mine, under the supervision of Mr. Snedden. They both have electric light and splendid machinery. In the No. 1 mine our party was taken far into the mine on coal cars drawn by steam haulage, but the incidents in other respects were much the same as those of the forenoon. In the evening we returned to Connelsville where we took supper, after which we boarded our special car and rode down to Uniontown, sixteen miles, where we put up for the night.

Friday, August 5th, was another beautiful day. Our party had five mines on the list to be visited to-day, all in the vicinity of Uniontown, or within a short run by our special car and locomotive,—Oliver Nos. 1 and 2 under the management of Fred C. Kleigley, a former Ohio man; the Leith mine, managed by Mr. Henry Whyel, the Redstone mine, and the Lamont mine. The mines in this region are all deep. The Redstone and Lamont are slope mines, the others reached by shaft.

I have found by experience that all coal mines in this region are alike in all essential features. There is quite a difference in the machinery, in the cleanliness, drainage, etc., but in the practical workings, far under the ground, they all appear very much alike. I also found myself growing familiar with the underground life and surroundings, and I think I went to-day into the mines and along the subterranean passages with as little trepidation, and feeling quite as much at home as any of the rest of the party. I even made up my mind that with a chart of a mine in my pocket, and a safety lamp, and a pocket compass I could go through any of these mines alone.

We had with us to-day, Mr. Duncan, the official mine inspector for this region, a gentleman of wide information, and thoroughly informed in everything pertaining to the mining business.

In starting down into the Leith mine, which has a shaft 281 feet in depth, Mr. Duncan gave us an account of a peculiar incident which happened to this mine during the last week in May, this year. There was a sudden flow of gas which put out every lamp in the mine, and of course stopped all work. On examination it was found that a hole ten inches in diameter had been burst open in the floor of the mine, out of which a flow of gas was coming so strong as to create a deafening roar.

The gas soon spread to every part of the mine, all the lamps

were extinguished, but there was no explosion and no accident of any kind. The miners came out in safety, and after two hours the flow of gas suddenly stopped, and all was right again. It was a very unusual occurrence, but shows what may happen in any mine in this region. If by any means fire had been communicated to the gas, either at the mouth of the mine or anywhere within the mine, an explosion would have followed which would have been extremely disastrous.

We found considerable gas in this mine to-day, in some of the workings a mile from the mouth of the shaft, but the fire boss had placed precautionary signals, and the air currents would probably soon clear it out.

Mine ventilation is one of the great problems of this, as of every deep mining region. So long as a good supply of fresh, pure air, can be constantly sent to every part of a mine, all goes well. The gas that may be generated is then carried out by the air current and all danger is avoided. But to thoroughly ventilate a mine whose workings extend in all directions three or four miles, five hundred feet beneath the surface of the ground, is not an easy task.

Ventilation is secured in these mines by means of a shaft near the center of the mine into which an immense volume of air is forced by a huge fan, worked by powerful engines. The mine is so constructed that the immense rush of air thus sent in, is divided so as to be carried to every part of the mine, and after passing to the remotest parts finds its way out at the shaft where the coal is taken out. In some of the mines an additional shaft and passage way is constructed for the outflow of the air, as the trains of coal cars passing in and out obstruct its flow to some extent.

Having taken the reader underground a good deal, in these letters, I will call his attention before concluding, briefly, to the outside part of the plant,—the coke oven. Coming through this region on the cars one is almost constantly in sight of long rows of coke ovens. At night their light is visible for miles, and by day and by night their smoke ascendeth up forever and ever. All the coal that is being taken out of all these mines in a region fifty miles in length and four miles wide, by thousands of miners, is being constantly converted into coke. Every mine has a battery of coke ovens, ranging in number from 200 to 500, according to the size and output of the mine.

A coke oven is a little room or furnace, built of fire brick. It has an opening in the center at the top and a door on the ground at one side. It will hold from two to three tons of coal. A battery of them consists of a large number adjoining each other, often constructed in semi-circular form with the lower

doors all opening on the inside of the semi-circle. Within this semi-circular space are the men who attend to the ovens. It is a hot and smoky place. As the workmen are surrounded on all sides by coke-ovens they necessarily get the smoke from one side or the other, no matter which way the wind may blow.

I remained on the inside of a battery for fifteen minutes on two or three different occasions. I stood by the men who worked in front of the furnaces, and with them breathed the smoke, and tried to make up my mind whether I should rather work here, or "down in the coal mine underneath the ground," and the only conclusion to which I could come was that I would rather work at anything else that I had ever seen tried, on land or sea, than at either of these.

After a coke oven is filled with fresh coal it soon takes fire from the heat from the former burning. It is permitted to burn for ten or twelve hours, a huge fierce flame coming out of the top of the oven. After most of the bitumen and gas have been consumed the doors are closed, almost air-tight, and finally quite so. In 36 hours the coke is perfect, being almost pure carbon, and bearing the same relation to coal which charcoal does to wood. Water is poured into the oven to put out the fire and cool the coke, and then the coke is taken out with large iron tongs and wheeled off on iron wheel-barrows, and loaded on cars which are standing near by to receive it.

A car load was being made up of the very finest and largest pieces of coke, all selected. This was a shipment to the silver mines of New Mexico, they said. The coke is shipped to every part of the country, north and south, from ocean to ocean. Col. A. E. Stonick, of Connellsville, Master of Transportation of the B. & O. Road, told me that the Company had recently been shipping coke through to Chicago, making the round trip and receiving the empty cars back inside of six days, and doing this at the rate of 40 car loads a day. This was done from some of the mines in the vicinity of Uniontown.

I could fill columns with facts and statistics of the business of this region, but have written enough, perhaps, to give a general idea of the field, which is all that can be attempted in newspaper articles. There are many millions of dollars invested in the business in this great coal and coke region, and millions of dollars are being made by the investors. The business just now is dull, they told us; the prices are down, and there is no money in coke. Every mine is doing just as little as possible; but still the business even now, in dull times, is immense.

I have said but little about the men who do the work in the mines and the coke ovens,—the thousands without whose ser-

vices the great business would cease to exist. There is not much that can be said about them of a very cheerful nature. They live here and work at this kind of business, it seems to me, because they have learned this and never learned anything else. Many of them, most of them, in fact, are foreigners, and nearly all, so far as I could learn, are descendants of men who have been engaged in the mining business for generations.

They live in little towns of their own in the vicinity of the mines, their dwelling-houses being owned by the Companies. A few own their own homes, but that is the rare exception. Their houses are plain and small frame buildings, close together in long rows, built on small lots, as if the ground were scarce. As a rule there is not a garden, flower, tree or vegetable to be seen on any of their premises. The only exception to this fact that we saw in the mining regions was at the Leisenring mine No. 1, where there were trees planted in front of the houses, and some had gardens.

But that people can be happy living in this kind of surroundings and engaged in this kind of business seems not only possible, but we must admit the fact, probable. In fact we saw nothing, or but little, to lead us to think that they were unhappy. They talked as cheerfully as people generally. The men, and women, and children all looked as if they were well fed and enjoyed good health.

I saw one wedding party. Some fifteen or twenty young people, all under 25 years of age, had gone in to Connellsville, four miles, on the electric car. The marriage ceremony had been performed and they had just returned to the mining town. They were all well dressed, though not quite up to Cadiz or Paris style, and looking strong, and healthy, and happy. Alighting from the car, the groom and bride marched in front and the rest followed in procession, and thus they passed on to their home and out of sight.

I had intended to write something concerning some of the pleasant people whom I met in Pennsylvania, and of the splendid set of men who were my traveling companions, but one little newspaper is not large enough for all these things and I must close. On the whole, it was one of the happiest weeks of my life and I shall long remember its events and the people who shared them with me.

In the evening of August 5th, after spending the day among the mines and coke ovens, we returned to Uniontown, and taking an evening train reached Pittsburgh at 11 o'clock, where we remained over night, and reached our Ohio home next day.

W. B. H.